

Are Benthic Invertebrate Communities Impaired in the Animas River?

YES, confidence=high

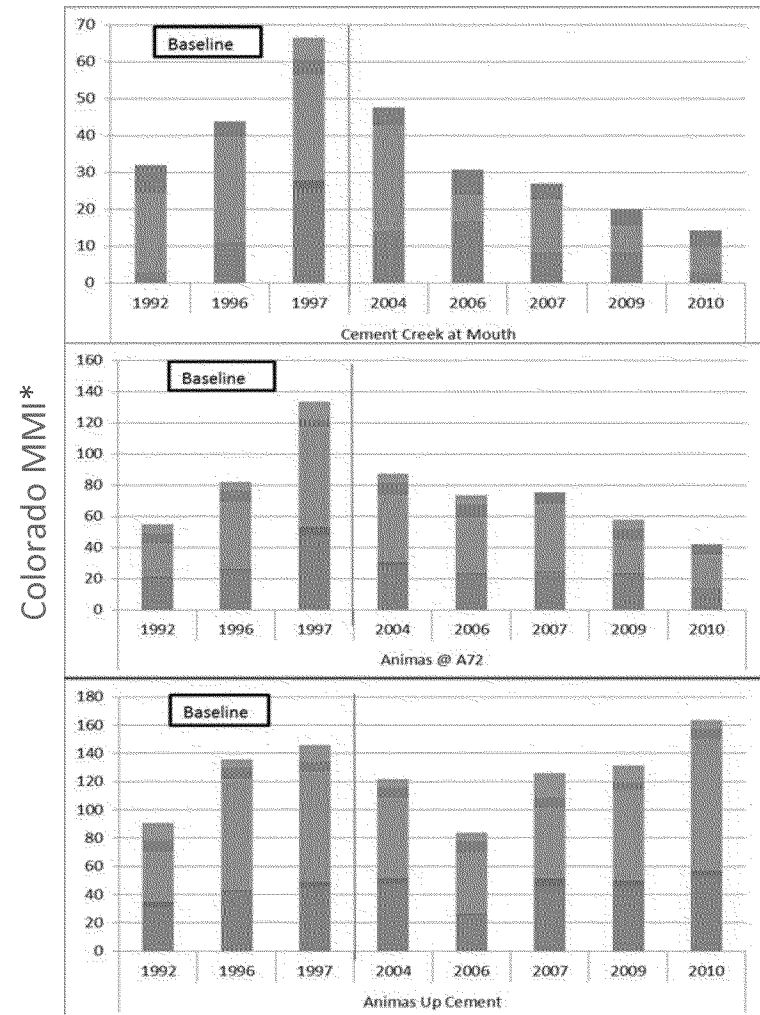
- **Evidence**

1. Concentrations of metals in sediments exceed levels expected to adversely effect invertebrates in the Animas River from Arastra Creek (above Cement Creek) through the canyon.
2. Toxicity testing indicated varying degrees of mortality in the Animas River from Arastra into the canyon.
3. Using Colorado Multi Metric Index (MMI), in stream communities have declined significantly in Cement Creek and the Animas River below Silverton (A72) since water treatment ceased (2003/4). Pattern persists through the canyon but is not observed above Cement Creek*

- **Uncertainties**

- C. Limited Sediment data to support #1 above.
- D. Patterns of metals contamination and toxicity testing mortality don't match well.

* Chester Anderson, B.U.G.S. consulting



Are Fisheries in the Animas River Impaired?

YES, confidence=high

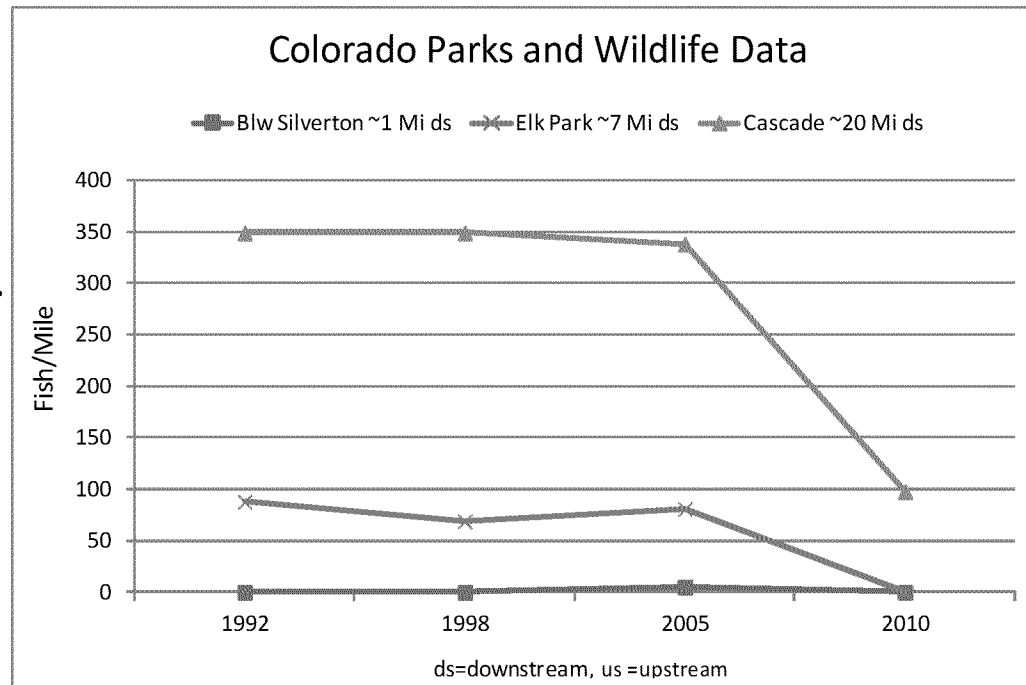
- **Evidence**

1. Metals concentrations exceed levels expected to cause toxicity to fish in the Animas River.
 - a) Upstream (to Arastra) effects are less than downstream effects and toxicity is expected to be primarily associated with seasonal exposures.
 - b) Downstream effects near town are predicted to be acute near Silverton but decreasing through the canyon. Subtle chronic effects may be occurring through the canyon.
2. Acute toxicity testing results show high mortality immediately downstream of Cement Creek in the Animas and seasonal acute mortality above Cement Creek.
3. Brook trout populations in the Animas River canyon have declined significantly from 2005-2010 and increased above town at Howardsville.*

- **Uncertainties**

- D. Potential seasonal pulses not well characterized for #1 and 2 above.
- B. Testing was done with rainbow trout (rainbow more sensitive than brook).
- C. Current status of fish population unknown.

*Colorado Parks and Wildlife, 2010 Animas River Report

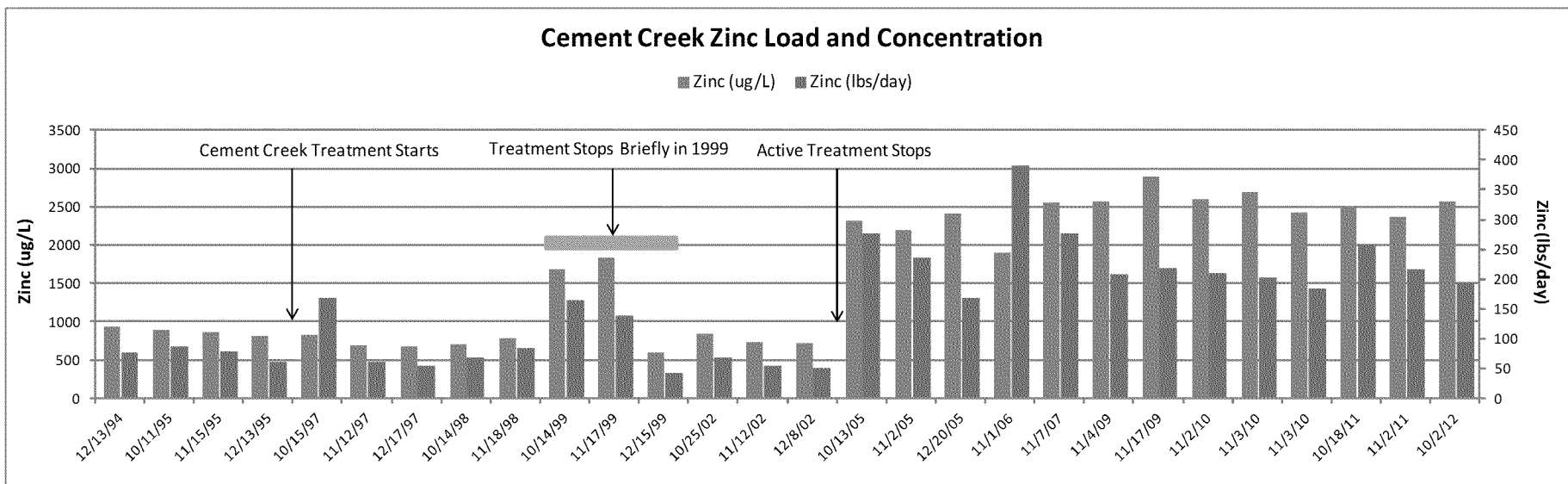


Has Water Quality Declined in the Animas River?

Yes, confidence=high.

- **Evidence**

1. Fish and benthic invertebrate populations have declined significantly since treatment stopped (slides 1 and 2).
2. Loads at CC48 have increased since 2003/4.



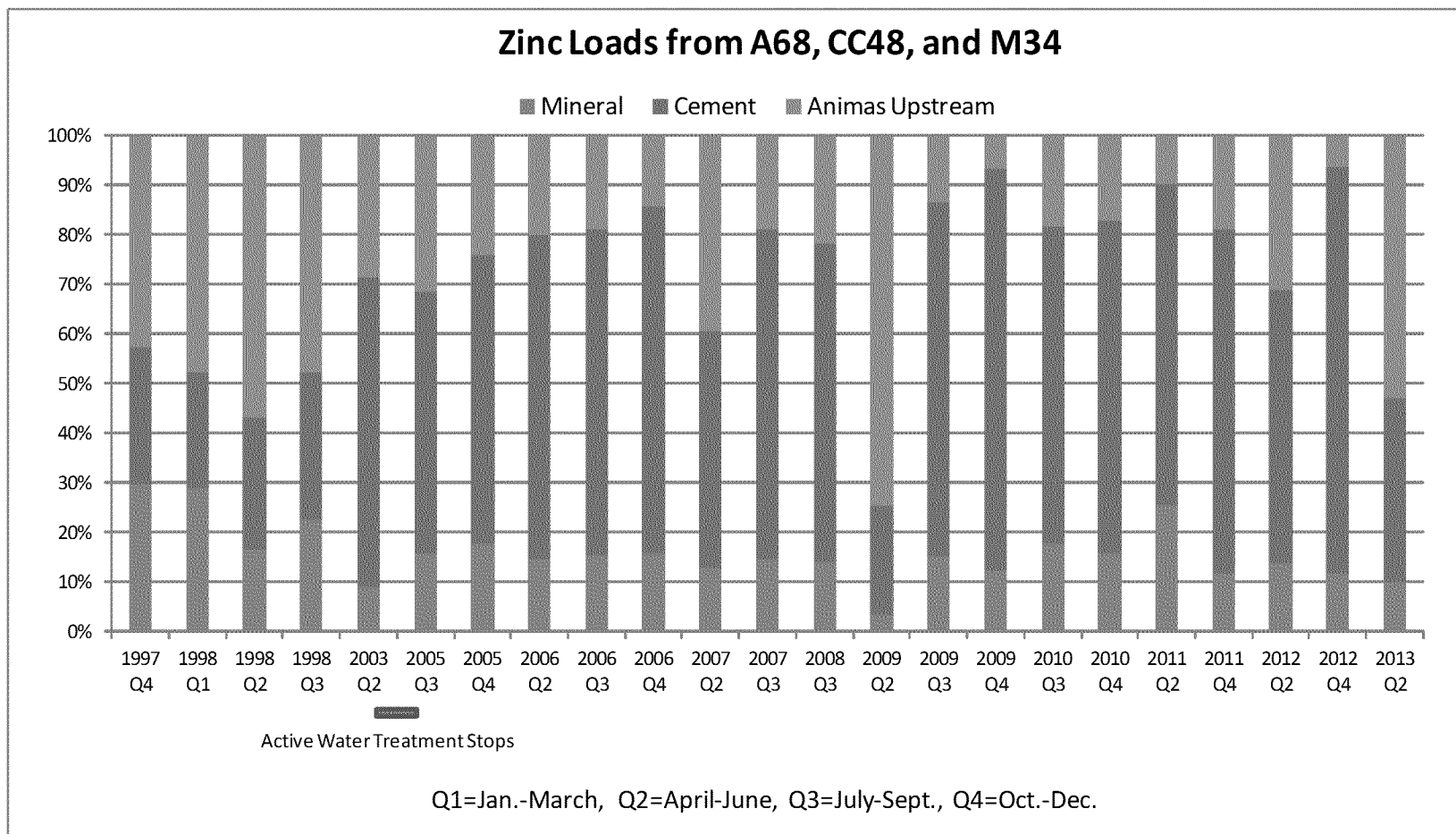
- **Uncertainties**

- A. Unable to verify quality of some historical data.
- B. Unequal distribution of historical data (some time periods are over or under represented).

Has Water Quality Declined in the Animas River (cont.)?

Yes, confidence=high.

Supplemental evidence that loads have increased in Cement Creek

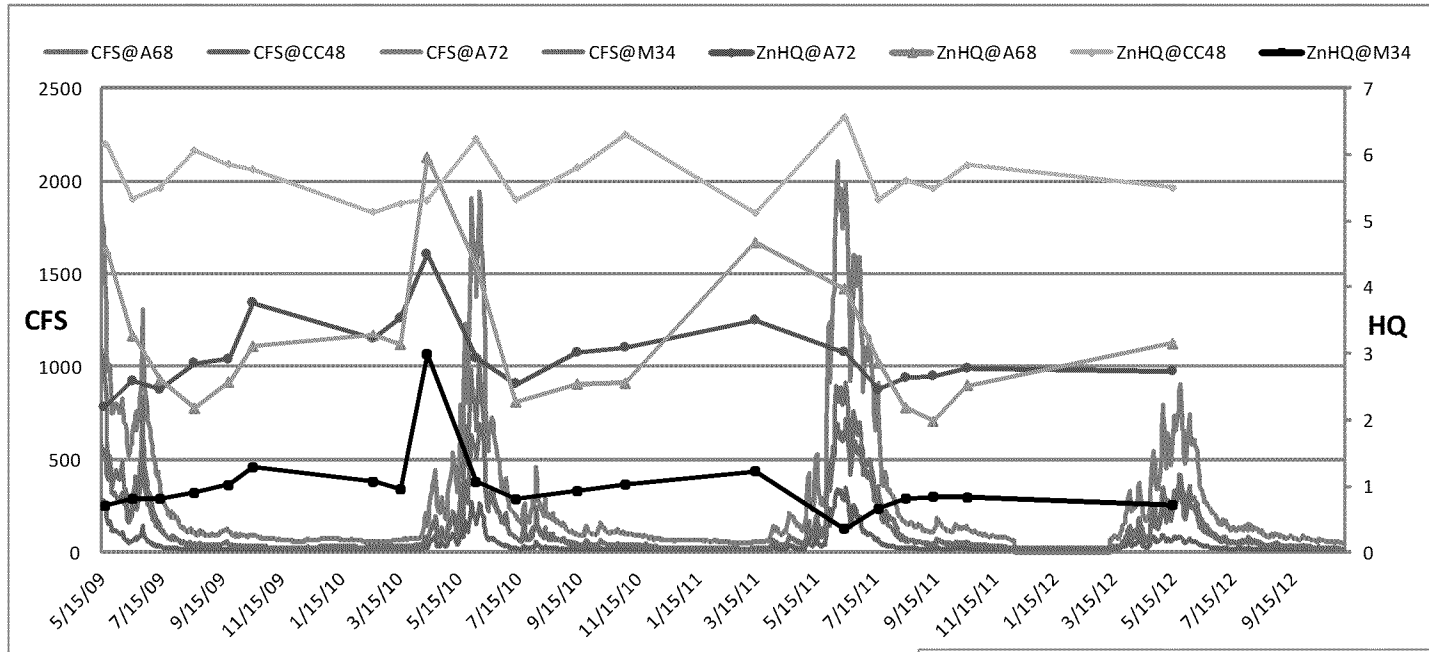


Is There Significant Contamination Upstream of Cement Creek?

Yes, significant prior to runoff. Confidence=moderate-high

Evidence

1. Highest Hazard Quotients (risk) seen prior to runoff for Zinc and Cadmium-no Aluminum.



2. No acute toxicity observed in October or November toxicity testing at A68 (above CC) but, 32% mortality observed in April.
3. Upstream contamination between Howardsville and town.

Uncertainties

- A. Difficult to capture seasonal pulses.

